

AMENDMENTS TO THE CLAIMS

The following is a listing of claims presently in the application, wherein Claims 1-88 are canceled and are replaced with substantially reduced new Claims 89-102:

Claims 1-88 (canceled)

89. (New) Invasive or minimally invasive apparatus for removal, breakdown or erosion of undesirable deposits present on, at or in actuating bodily implants or actuating bodily-members or organs of a patient comprising:

at least one distal acoustic emitter capable of directing acoustic energy toward a target bearing said deposits for the purpose of removing at least some of said deposit and recovering a desired degree of actuation;

an exciter to power and control the emitters acoustic operation;

the emitter situated inside of or behind a deformable or soft standoff, the standoff at least one of (i) preventing or inhibiting direct emitter-target contact, (ii) allowing for gentle stoppage or suppression of the targets actuation for deposit removal, and (iii) allowing for passage of the emitter into or through the actuator without damaging the actuator;

a proximally grippable scope, catheter, handle, guidewire, sheath or a gripping robot distally supporting the emitter and allowing a practitioner to control acoustic coupling of and use of the emitter on the target;

wherein by actuating is specifically meant that the implant or body member being treated for deposit has (a) adjacent, joined or mating portions which normally at least one of swing, hinge, pivot, distend, or flex relative to each other at least once or (b) mating parts which are plugged, connected, threaded or passed in-to or through each other at least once; and

said deposit either currently negatively impacts normal actuation or threatens to worsen such that it eventually degrades actuation, thereby negatively impacting the patient.

90. (New) The apparatus of claim 89 wherein said actuation comprises any one or more of:

desirable swinging, pivoting, hinging or occluding;
desirable plugging, unplugging, threading or connecting; or
desirable flexing or distending.

91. (New) The apparatus of Claim 89 wherein the implant or member is a cardiac, arterial or lymphatic valve of any natural, prosthetic or implanted type or is an implanted connector of any type.

92. (New) The apparatus of Claim 89 wherein a drug or chemical agent is employed at any time to aid in the acoustic removal of the deposit material in any manner.

93. (New) The apparatus of Claim 89 wherein the acoustic power employed is sufficient to cause at least one of blood streaming, blood or deposit cavitation, deposit erosion or deposit-heating useful in said removal.

94. (New) The apparatus of Claim 89 wherein acoustic power is being delivered continuously or in a pulsed manner, either gated or not gated to the heartbeat.

95. (New) The apparatus of Claim 89 wherein either or both of imaging guidance or acoustic signatures are employed to any of plan, assess, guide, gate or monitor a removal task.

96. (New) The apparatus of Claim 95 where said imaging or acoustic signatures specifically monitor an aspect of actuation state or performance.

97. (New) The apparatus of Claim 95 wherein the specific location of preexisting deposits on or at an actuator is known via said imaging or signature and targeted meaning the fouled portion of the actuator is specifically preferentially targeted.

98. (New) The apparatus of Claim 95 wherein the imaging or signature acquisition means is integrated with or proximal to the emitter.

99. (New) The apparatus of Claim 89 wherein any one of the following is employed:

- a cavitation enhancing agent, including microbubbles;
- a physical trap or drain to safely catch or route deposit debris after removal.

100. (New) The apparatus of Claim 89 wherein a deposit includes one or more of:

- pannus, bacteria, endocarditis related growths, calcium containing deposits, fat containing deposits, fungus, plaque, fibrous containing deposits, thrombus, clot related materials, any flow-restricting deposits or biofilms.

101. (New) The apparatus of Claim 89 wherein the actuation occurs between one or more of:

- two or more portions of one or more natural body parts;
- two or more portions of one or more implants regardless of whether the implant(s) is constituted of tissue or engineering materials; or
- a natural body part and an implant part.

102. (New) The apparatus of Claim 89 wherein the standoff comprises a saline filled balloon.